THE NAVAJO NATION

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Rob Bornstein
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Dear Rob:

Enclosed are some of the comments made by the Navajo Superfund Program's technical staff on the draft workplan. On the whole, the workplan reads exceedingly well, and we would like to commend you for an excellent job. We are all very happy that you have already incorporated, or are about to incorporate, some of the comments that I passed on to you over the phone.

I look forward to working with you when you are down here, and to some interesting discussions. We all expect to learn quite a bit from this project. As the workplan is quite tentative, and open-ended, I assume that many details will be worked out as the investigation progresses. From our staff, we will have two, possibly three, personnel to assist and participate in the investigations: Stanley Edison and I will assist you to the fullest extent required, and Patrick Antonio will help if needed. If I am not available, please talk to Stanley or Patrick, and we will do all we can to make this project successful.

Thank you for your cooperation, and do not hesitate to contact us at (602) 871-6859.

Sincerely,

Gaurav Rajen

Dr. Gaurav Rajen

cc: Joanne Manygoats, Director
Navajo Superfund program

Louise Linkin
Navajo Environmental Protection Adminstration

COMMENTS ON THE REVISED DRAFT COPY OF
THE NAVAJO-BROWN VANDEVER
AND
THE NAVAJO-DESIDERIO URANIUM MINING AREAS
NAVAJO NATION
PRELIMINARY ASSESSMENT WORKPLAN

by
THE NAVAJO SUPERFUND PROGRAM
P.O. BOX 2946, WINDOW ROCK, AZ, 86515

WORKPLAN

Specific Comments

Radiation Survey

There is no mention of radon detection equipment. Although an indoor radon survey may be outside the scope of the present workplan, radon detection devices must be placed on the tailings material, and in the ambient air. Section V details the ambient air restrictions on radon concentrations, quoting 40 CFR 192. However, there is no mention in the workplan of any attempts to measure radon levels. The tailings materials are known to be emitters of high levels of radon flux. Estimates of this flux will allow an assessment to be made of how elevated radon levels may impact neighbouring communities. In the past, major environmental impacts of many radiologically contaminated Superfund sites have been deemed to be elevated indoor and outdoor radon levels.

The ATSDR has recommended that personal radiation dosimeters be provided by appropriate agencies to local residents to estimate the external radiation exposure being received. This recommendation could easily be a part of the workplan. If implemented, it will provide extremely valuable information.

Radiation Surveying and Sampling

What exactly is the definition of a "hot spot"? We recommend a value of about 50 microR/hr. However, all values above 2 - 3 times the background must be noted. A value of 50 microR/hr corresponds to about ten times the backgrond for the area. Samples may not need to be collected at all the "hot spots"; as, representative samples of similar materials could be collected, as well as composite samples of several hot spots. The hot spots/areas should be flagged off.

Sampling Design

At the sites, contamination occurs in areas that are not within a 250/500 feet radius of the homes, and that cannot be considered to be tailings piles. Such an area, for instance, is the field next to the road paved with mine waste at the Brown-Vandever site. However, since the residents frequently walk all over the site, and graze their livestock across the site, these areas will also need to be sampled.

Groundwater Sampling

All the residents in the area are not conected to municipal water supplies, and all of the homes in the area do not contain household taps. Therefore, all the wells in the area within a four-mile radius fron the site should be sampled, in addition to samples being collected from household taps.

Surface Water Sampling

Soil samples will need to be collected along the surface washes upstream and downstream of the piles of mine waste to estimate the surface transport which might occur through surface water runoff. Collecting soil sediment samples at two or three depths using an auger will allow estimates of transport from past flooding events.

Air Sampling

Radon concentrations must be measured in the ambient air. The radon flux coming off the piles of mine waste must also be measured. An estimate of this flux can be made by placing devices that measure radon concentrations on top of the mine waste material, and then covering them with aluminum paint cans.

Contamination Prevention and Waste Handling

Some thought must be given to the disposal of waste that will be generated through the site assessment work.

Laboratory Selection

The QA/QC workplan mentions a third laboratory, Teledyne Isotopes of New Jersey. The workplan only mentions two: Eberline, Albuquerque, and CEP, Santa Fe.

General Comments

Nan-a-bah Vandever Uranium Mine

Waste from the Nan-a-bah Vandever uranium mine is also present on the Brown-Vandever uranium mine site. Since this waste is present on the same site and impacts the same communities as the Brown-Vandever uranium mine waste it should be included as part of this workplan. The site has been assessed by the Navajo Superfund Program, and the site has been recommended for a high priority Screening Site Investigation by the U.S. EPA. It is also going to be included in the final health advisory that will be issued by the ATSDR in the near future.

Waste Quantity

There is no mention in the workplan of attempts to estimate the amount of waste that is present on the sites. Such estimates could be made through measurements of the dimensions of the mine waste piles using an optical device. The areas which contain surface contamination will also need to be estimated.

Sample Analysis

The suite of radionuclides which the samples will be analyzed for is not specified. Uranium and thorium isotopes must also be analyzed for in the proposed tests, along with tests for radium 226 and radium 228 and gross alpha and gross beta tests. Levels of uranium and thorium are major factors in the perceived environmental hazards of radiologically contaminated sites.

Some of the samples of material collected from the mine waste piles should be subjected to a Toxicity Characteristic Leachate Procedure (TCLP) test. The TCLP analyses will indicate what contaminants might be leaching off from the piles of mine waste.

A few samples of of the mine waste should be physically screened and then analyzed. Knowledge of the size of particles which contain the major percentage of contaminants will be very useful in determining remedial strategies. Such knowledge would answer questions such as, "Could physical screening separate the mine waste into fractions that are less and more hazardous?"

Samples of Biota

The ATSDR has recommended that samples of biota be collected from the site. The workplan makes no mention of this recommendation. Trace metals analyses should be performed of some samples of plant tissues collected from plants that are growing on some of the older piles of mine waste material. Such analyses could be performed at Northern Arizona University.

SITE SAFETY PLAN

Personnel Protection

Twin-air respirators should be used, especially when collecting samples of waste material. In the experience of the Navajo Superfund program, visible quantities of dust will be kicked up when an auger is used on the piles of mine waste. Similarly, winds are known to increase radionuclide concentrations around ore piles by factors of greater than fifty.

Use of aluminum foil to protect reproductive organs from radiation exposure is recommended.

Site Entry Procedures and Special Considerations

All personnel approaching contaminated zones should possess radiation alert devices, which will be set at 100 microR/hr. If the devices are enabled, then the personnel should proceed only if they have a radiation measuring device with them, and are able to monitor the radiation levels in the working zone.

Personnel approaching closest to contaminated areas should be rotated to ensure that exposure to specific individuals is kept at a minimum.

Local Resources

The City of Grants could provide support services for ambulances, police, fire etc.

Hazard Evaluation of Radionuclides

Thorium and its isotopes should be included in this section.

SAMPLING QA/QC WORK PLAN

Background

Paragraph 1: The mine waste could have been physically screened to refine the ore, and extract high grade material. The waste that remained from this process would have been deposited on site.

The "site" is actually two sites which are physically separated by several miles. Paragraph 2, page 3, of the QA/QC plan does not make this clear.

The information is based on the Preliminary Assessment reports produced by the Navajo Superfund Program, and referenced in the ATSDR Public Health Advisory.

Federal/State Action Levels

There is a New Mexico and Federal (Nuclear Regulatory Commission) limit on radiation exposure in the outdoors environment of 0.5 rem/year.

Quality Assurance Objectives

Special analytical procedures must be performed to obtain concentrations of uranium and thorium isotopes in the samples.

Sampling Design

The workplan mentions a radius of 250 feet from the residences in which samples will be collected from hot spots. The QA/QC plan mentions a radius of 500 feet for this area. Other than within this area, and other than the piles of mine waste, there exist several areas of contamination at the sites. Such areas are near adits at the Brown-Vandever site, where material is widely dispersed and not in a pile, and also in fields next to a haulage road. Readings of at least 100 microR/hr can be obtained in these areas. These areas should be sampled for subsequent analysis.

It is important to note that the residents make use of the complete area of the site, and do not restrict their activities to within a short distance from their homes. For instance, they graze their livestock all over the sites. Therefore, to characterize the amount and extent of contamination associated with these sites, samples will have to be taken at locations that are not within a 250/500 feet radius of the homes, and that are not on the tailings piles.

Radon Measurements

Radon measurements will need to be made for ambient air concentrations, and also to estimate the radon emanating from the piles of mine waste.

Photographic Records

Extensive photographic records will need to be made of locations at which radiometric measurements are made, of all sampling locations, locations at which radon measuring devices are placed, etc.

Laboratory Selection

The QA/QC workplan mentions a third laboratory, Teledyne Isotopes of New Jersey. The workplan only mentions two: Eberline, Albuquerque, and CEP, Santa Fe.

Table 3 continued

C. Air		Limits
40 CFR Part 192		
Outside Rn^{8}-222	1. averaged over one year and over disposal site.	20 $pCi/m^2/S$
	2. annual average concentration at any location outside of the disposal site.	0.5 $pCi/m^2/S$
Indoors Rn decay-product	concentration including background in any habitable building.	0.03 WL[4]

D. Exposure		Limits
40 CFR Part 192		
Indoors - photon radiation	above background	20 uR[4]/hr
40 CFR Part 61[9]		
Outdoors - airborne radionuclide emissions	annual dose equivalent whole body excluding radon	25 mrem
10 CFR Part 20[10]	1. annual effective dose equivalent from all known sources, both licensed and unlicensed.	0.5 rem
	2. annual effective equivalent from sources under a licensee's control.	0.1 rem